XMANAI
MAKING AI UNDERSTANDABLE
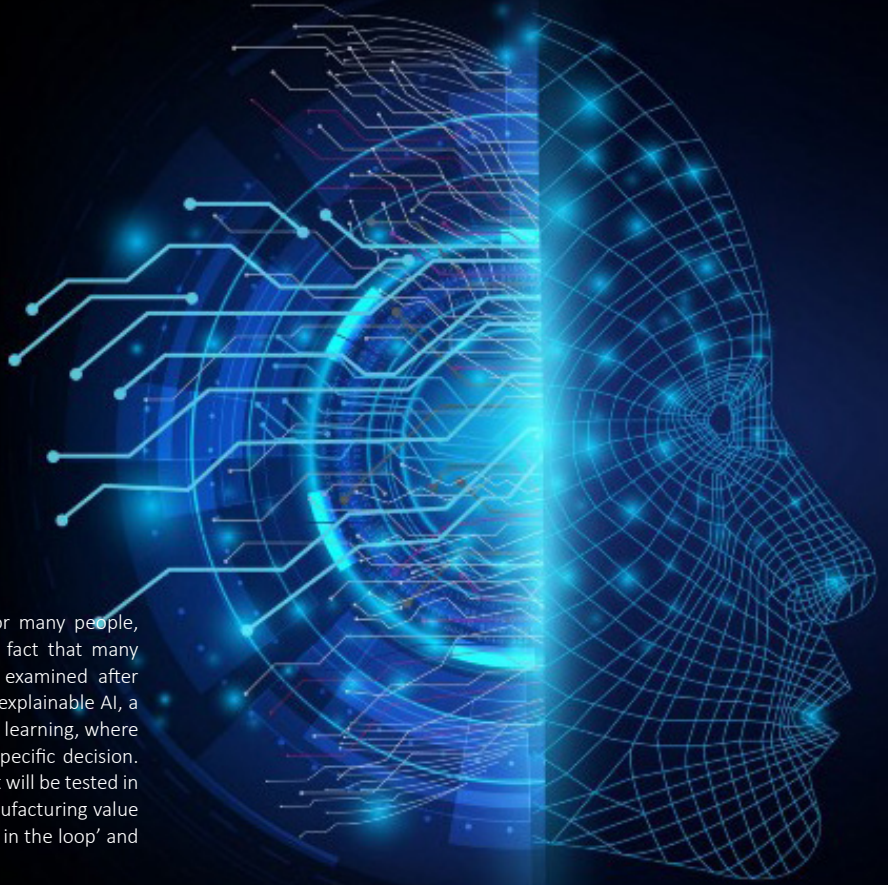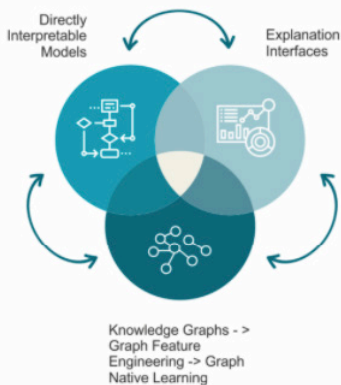
MOVING FROM 'BLACK BOX' TO 'GLASS BOX'

What is artificial intelligence (AI) and how does it work? For many people, these questions are not easy to answer: this is due to the fact that many machine learning and deep learning algorithms cannot be examined after their execution. The EU-funded XMANAI project will focus on explainable AI, a concept that contradicts the idea of the 'black box' in machine learning, where even the designers cannot explain why the AI reaches at a specific decision. XMANAI will carve out a 'human-centric', trustful approach that will be tested in real-life manufacturing cases. The aim is to transform the manufacturing value chain with 'glass box' models that are explainable to a 'human in the loop' and produce value-based explanations.

IN ORDER TO ACHIEVE FAIR, ACCOUNTABLE AND TRANSPARENT (FAT) MACHINE LEARNING AND DEEP LEARNING, XMANAI PROMOTES THREE CIRCLES OF TRUST IN AI:
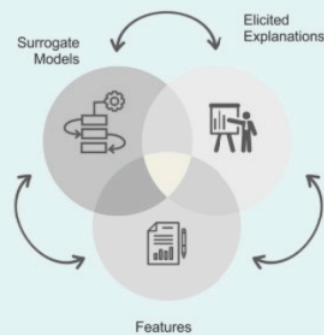

Trust Level 3
ESTALISHED XAI CIRCLE

Directly Interpretable Models — Explanation Interfaces

Knowledge Graphs -> Graph Feature Engineering -> Graph Native Learning

Trust Level 2
DEVELOPING XAI CIRCLE

Surrogate Models — Elicited Explanations

Features

Trust Level 1
DEVELOPING XAI CIRCLE

Visualizations — Sample Data Exploration

Features

ESTABLISHED EXPLAINABLE AI (XAI) CIRCLE (AI TRUST LEVEL 3)

includes "Intrinsically interpretable AI models including Graph AI models that provide context for decisions with their knowledge graphs, efficiency and credibility by highlighting which individual layers and thresholds have led to a prediction. Business experts on their behalf come across the emerging explanation interfaces that help them relate to how data, predictions and algorithms actually influence their decisions."
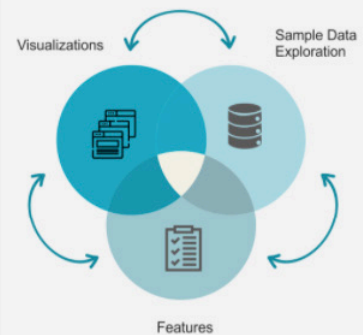
DEVELOPING EXPLAINABLE AI (XAI) CIRCLE (AI TRUST LEVEL 2)

includes ""Hybrid" AI algorithms since the typical basic, machine learning and deep learning algorithms are complemented by post hoc interpretation methods, e.g. surrogate models. Explainability of results for the business experts is also pursued through elicited explanations by the data scientists and by highlighting the features that are necessarily present/absent from a prediction."

EMERGING EXPLAINABLE AI (XAI) CIRCLE (AI TRUST LEVEL 1)

includes "Traditional AI algorithms in which the focus of data scientists is on understanding the data at hand by exploring the industrial data, experimenting with the extracted features to construct appropriate AI models and visualizing the results. Such visualizations typically act as the primer for communicating results to the business experts in order to inform them on how to take action."

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XMANAI consists of 15 partners from 7 countries Italy, Germany, Spain, Estonia, Portugal, Greece and Cyprus. The consortium is very well balanced in terms of research-industry collaboration as the next table depicts, containing a very well though constructed mixture of collective expertise from industry, research, academia, technology providers with solid background on manufacturing, data science and AI, and big data, and human-machine ethics sectors.
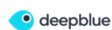

Field of science

Natural sciences/computer and information sciences/artificial intelligence/machine learning/deep learning

Programme (s)

H2020-EU.2.1.1. - INDUSTRIAL LEADERSHIP - Leadership in enabling and industrial technologies - Information and Communication Technologies (ICT)

Topics (s)

ICT-38-2020 - Artificial Intelligence for manufacturing

Call for proposal

H2020-ICT-2020-1

Funding Scheme

RIA - Research and Innovation action

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Start date: 1/11/2020
End Date: 30/04/2024
Website: www.ai4manufacturing.eu

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Contacts

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